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A WELL INOCULATED ROOT

ALFALFA AND OTHER LEGUMES INOCULATION



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ALFALFA INOCULATION

The Manitoba Agricultural College investigations show that many of the failures in growing alfalfa in the Province are due to the fact that the soil or seed was not inoculated with nitrogen-fixing bacteria. These small organisms, living in nodules on the roots of the plant, have the faculty of being able to convert the nitrogen of the soil air into a form that can be used by the plant. This is very necessary, as the soil under ordinary conditions is not rich enough in the above element to supply the needs of this highly nutritious legume. It is therefore necessary to have these germs present in the soil, if success is to be insured. In some districts they are found naturally in the soil, but on the average farm they have to be introduced in some way. This point was illustrated quite clearly on several of the demonstration plots in the Province. The first year little difference could be noticed in the treated and untreated portions; however, the plant roots on one acre produced nodules, and the plants on the uninoculated tract did not. The second year there was an appreciable difference, the inoculated plot producing much more vigorous plants and giving a higher yield of hay.

There are two ways of insuring this success, or in other words, there are two methods of inoculation. The first is called "seed inoculation with nitro-culture," and consists in applying the bacteria to the alfalfa seed. The germ in this case is grown on a jelly-like substance called gelatine, and is put up in small bottles. There is enough material in each bottle to inoculate 60 lbs. of seed. In using the culture the following points should be observed.—

DIRECTIONS

FOR INOCULATING ALFALFA, CLOVER AND OTHER LEGUMES

1. Do not open the bottle of culture nor expose it for any length of time to the light until you are ready to inoculate the seed, and do not inoculate more seed at one time than can be sown in a day.
2. The whole contents of the bottle may be used on a small amount of seed without doing any harm.
3. To treat the seed, put into a clean dish one pint of sweet skimmed milk and four tablespoons of sugar. Heat the milk to the boiling point, stirring occasionally, and boil it for a minute or two. Let it stand until the milk is cold. If less than a bushel

of seed is to be treated, proportionately less milk and sugar may be used.

4. When the milk is cold, pour a little into the bottle of culture, replace the cork and shake the bottle vigorously. Pour this portion of the milk from the bottle back into the dish. Repeat this at least six times. The jelly in the bottle will not dissolve, but should be broken up with a clean stick and mixed with the milk. The bacteria are on the surface of the jelly, hence it is not necessary that the latter be dissolved.
5. Heap the seed on a clean floor or table, pour the mixture over it and mix thoroughly with the hands or shovel until each seed is wet. It is important that this mixing be done very thoroughly, so that each seed will be inoculated.
6. Spread the seed in a thin layer, out of sunlight, handling over at intervals until it is dry enough to sow. This will not usually take over half an hour.
7. The seed should be sown immediately after treatment.

The second method is known as "soil inoculation," and consists of spreading broadcast on the land which has been prepared for seeding, some soil from a field of vigorous growing alfalfa.

There are a few points to be observed when this system is used:—

1. Soil should be from a field that is producing nodule-bearing alfalfa plants.
2. The soil should be fresh and should not be exposed to strong sunlight or allowed to dry out.
3. Best results are obtained when the soil is applied at time of planting.
4. It is preferable to spread the soil on a cloudy day and harrow the field immediately.
5. The soil should not be applied in quantities of less than 100 lbs. per acre.

Both of the above plans have given good satisfaction where care has been taken in doing the work. The first has the advantage where a large acreage is to be sown and there are no alfalfa fields in the vicinity. The cost of shipping large quantities of soil increases the expense of getting a stand of alfalfa. With the nitro-culture there is also less danger of introducing weed seeds. If the bacteria are living when re-

ceived, and the directions are carefully followed, there is no reason why nitro-culture will not give good results. Some growers, to make inoculation doubly sure, use both methods. Nitro-culture should be used in less than a month after it is received, as it works better when fresh.

The nitro-culture may be secured by sending an application to the Bacteriological Department, Manitoba Agricultural College, enclosing twenty-five cents, which pays for the postage, bottle and mailing case, with a small margin for the culture material.

The Manitoba Agricultural College is also prepared to supply nitro-culture to inoculate the seed of Red Clover, Sweet Clover, Field Peas, Garden Peas, Garden Beans and Sweet Peas. The same method of treating the seed is followed as in the case of alfalfa.

A special strain of bacteria, however, is required for each of the above and in ordering you should state which legume you wish to inoculate.

Enough culture to inoculate one bushel of seed of any of these legumes will be sent for TWENTY-FIVE CENTS.

Address:

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Alfalfa at Manitoba Agricultural College



